DRY-LAND AND WATER-BASED LOG SORTS

Prepared for:

Economic Development Branch
BC Ministry of Sustainable Resource Management

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July 2002

BUILDING BLOCKS FOR ECONOMIC DEVELOPMENT & ANALYSIS

PREFACE

PURPOSE

Building Blocks have been conceived and developed by the Economic Development Branch of the Ministry of Sustainable Resource Management, under the guidance of Nancy South, Manager Economic Analysis, as an analytical tool that supports British Columbia coastal and land and resource use planning and decision-making and economic development initiatives. The Blocks contain concise business and sector information for a broad range of resource-based business types in BC. At this point, there are more than 30 Blocks either complete or in draft form. Several more Blocks have been identified as high priority by planning tables and other client groups. Additional Building Blocks will be developed over time, and some Blocks may be updated. For the most current Building Blocks, please see the Ministry of Sustainable Resource Management website, at: http://srmwww.gov.bc.ca/rmd/ecdev/

ACKNOWLEDGEMENTS

Generous support in terms of both funding and staff time has been provided by the Ministries of Energy and Mines; Water, Land and Air Protection; Agriculture, Food and Fish; and Forests, as well as by Skeena and Coast Regions of the Ministry of Sustainable Resource Management.

BENEFITS

Building Blocks are expected to provide the following general benefits:

- Increase efficiency and more informed decision-making by providing readily accessible, credible information to planning and economic development processes;
- Improve the consistency of economic information across planning areas;
- Support economic analysis and decision-making that occurs outside formal coastal and land use planning processes; and
- Provide linkages between economic analysis and other social and environmental analytical tools (through identifying resource requirements to support economic activities and general compatibilities with other sectors and values).

LIMITATIONS

Every effort has been made to ensure that the information contained in Building Blocks is accurate and consistent. Approved, credible data sources are the foundation for Building Blocks. All Blocks were reviewed by sponsoring agencies and other experts. However, users are cautioned that information is used at their own risk, and that the authors and sponsors are not liable for any damages. Any conclusions or interpretations by the authors are not intended to represent government policy. Also, note that Building Blocks do not provide site specific information nor do they consider requirements for sustainability (social, community, environmental).

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RECOMMENDED REFERENCE/CITATION

BC Ministry of Sustainable Resource Management, 2003, Building Blocks for Economic Development and Analysis, *[Title of Sector]*. http://srmwww.gov.bc.ca/rmd/ecdev/

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1.0 PURPOSE AND SCOPE OF THIS STUDY

The Ministry of Sustainable Resource Management, Economic Development Branch, has identified an analytical tool, described as a "building block" which is intended to support land use decision-making by way of providing an accurate description of the economic outcomes of various building blocks (commercial activities).

This study estimates the investment of resources and economic outcomes associated with a forest-sector building block, **dry-land and water-based log sorts.**

Limited economic data describing this specific building block was available through the Ministry of Forests, or other provincial government agencies. The Ministry of Provincial Revenue collects and regularly updates cost data from forest industry operators for the purpose of deriving appraisal estimates for incorporation in the Comparative Value Pricing System – this is the primary mechanism by which the provincial determines stumpage rates. Data within the Ministry of Provincial Revenue is not sufficiently refined as to capture the economic outcomes associated with either water-based or dry-land log sorting. For this reason the Ministry of Provincial Revenue was unable to provided cost data relevant to the building block of interest. An economic description of log sorting relied, for the most part, on the participating industry operators.

Industry operators provided data to Sterling Wood Group on a confidential basis and for the purposes of this study only. Sensitivities regarding the use of data by a government agency related primarily to the Comparative Value Pricing System – a separate, long running, formal process between government and industry operators facilitates the exchange of operating cost information.

2.0 AN ECONOMIC PROFILE – LOG SORTS

The Ministry of Sustainable Resource Management (MSRM) has designed a "Building Block Template" which identifies ten design elements. This section describes the design elements for the building block of interest in accordance with the template identified by the MSMR.

2.1 Overview –Geographic Description

Two forms of log sorts exist (i) water-based log sorting, and (ii) dry-land log sorting. Water-based log sorting is predominantly undertaken on the coast of British Columbia with limited use on inland waterways. The coastal region of British Columbia is divided into three sub-regions:

- South Coast, including Vancouver Island
- Mid-Coast
- North Coast

Water-based log sorting occurs throughout each of these sub-regions of the coast.

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The interior of British Columbia is described in the Interior Appraisal Manual as the entire province of British Columbia, excluding the Vancouver Forest Region (as established by the Forest Act and Regulations) and that part of Prince Rupert Region west of the Cascade Mountains Administrative Line from Tweedsmuir Park to the State of Alaska. Very little water-based log sorting is conducted in the interior of the province.

2.2 Log Sorts – Dry Land and Water Sorts

Log sorting is undertaken to ensure the efficient allocation of timber harvests to end use (timber processing facility). Major licenses sort "camp run" timber harvests as a normal course of business so as to ensure each internal processing facility is allocated the preferred range of species, log grades and log dimensions. Log sort operations typically serve as an outlet for harvesting on the part of small business operators, private land owners and other tenure holders and the range and description of log sorts manufactured are typically tailored to met the operators own specifications (as determined by downstream log processing operations) and any custom sorting the operator may undertake for either domestic or export markets. Log buyers generally pay a premium for a log sort – the individual logs within the log sort reflect a consistent set of characteristics.

Logs sorts are configured so as to provide for a log decking area, sorting area, log storage "bins", if adjacent a waterway dewatering and watering facilities, a dock and loading ramp, several boom anchors, a fuel storage site and other support facilities.

The preferred form of log sorting, on both the coast and in the interior is on dry land. Water sorting is advantageous in that (i) no water / dewater facilities are required, (iii) no significant land area is required and (iii) the equipment requirements are significantly reduced (sorting is by boom boat and skiffs requiring no log loaders, trucks or stackers. A dry land sort enables scalers to view the entire log and determine a log grade based on all visible characteristics of the log – water sorting only permits the scaler to view that portion of the log above the water surface. Water log sorting on the coast is most frequently undertaken at the log dump of a coastal logging camp; at the log dump, sorting is typically limited to a species sort so as to produce pure cedar and whitewood log booms for barge loads for transport to a dry land sort.

3.0 DRY LAND SORT — REGION: COAST

3.1 Geographic Range

- Four Sub-regions: South Coast, Mid Coast, North Coast, and Vancouver Island.

3.2 Resource Requirements

- May be a mix of Crown and private land or entirely Crown / private industrial land.
- Requirement of land may range from as small as 3 hectares to as much as 15- 20 hectares. Depending on log storage requirements and the extent of sorting activity.
- Average area 4.5 hectares of land and 5.0 hectares or water (storage and transportation).

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- Minimum economic annual throughput, 120,000 m^3 or approximately $1.1 million revenue (log sorting fees).

3.3 Products

- Custom & internal (own processing) log sorts for:
  - Export markets – average fee for sorting for export is $9.00 – 9.50 / m^3.
  - Domestic market - average fee for sorting for domestic is $6.00 – 7.00 / m^3.

3.4 Investment & Annual operating costs.

- Average investment in site, improvements and equipment, $2.5 million, at 120,000 m^3 /year throughput level.
- Lease – average scale facility ~$75,000 per year.
- Site maintenance –$ 1.20 /m^3 per year. ($28,000 – 30,000 / ha/ year).

3.5 Infrastructure

- Log transportation providers in the form of trucking, log towing and log barging.
- Supplier firms in the form of fuel, materials (wire rope / strapping) and equipment maintenance.
- Waste / debris control – (Transport of hog fuel).

3.6 Market Outiets

- Offshore custom log buyers (log export).
- Domestic (BC-based) log buyers and log processors (sawmills, pulp mills etc.)

3.7 Capacity

- Based on minimum requirement of 120,00 million m^3 per year, aggregate harvest of Crown timber on the coast could support over 100 unrelated dry land sorts.

3.8 Labour Markets Employment

- Average dry land log sort supports 13 fulltime jobs – based on 200 shifts per year.
- Payroll averages $720,000 per year.

3.9 Government Revenues

- For longer term use of Crown land – value of a lease is based on the actual land value as determined by the B.C. Assessment Authority.
- Annual rental fees - minimum $500/year – typically 8% of the lease value. vary according to a schedule of prices by log hauling zone.
- The Crown Land, Land Management Manual (Volume 3, Chapter 3.3) describes the forms of land use tenures and pricing applicable to the use of Crown land.

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- Property taxes (municipal) – ranges widely to as high as $20K / ha / year.
- Contribution to stumpage revenues – estimated at $2 / m^3.

3.10 Regulatory Regimes

- The *Forest Act*, Section 73.1– Scale site authorization.
- *Environment and Land Use Act.*

3.11 Coefficient Area of Crown Land

- Manufacture of log sorts for the purposes of **log export** generates fees (to operator) on average of $9/$m^3$ – land use coefficient estimate at $240,000 / hectare *
- Manufacture of log sorts for the purposes of **domestic sale** of logs generates fees (to operator) on average of $7/$m^3$ – land use coefficient estimated at $190,000 / hectare *

  * based on log throughput of 120,000 m^3 / sort yard / year

4.0 DRY LAND SORT — REGION: INTERIOR

4.1 Geographic Range

- All regions east of Hope, Bella Coola and Terrace.

4.2 Resource Requirements

- May be a mix of Crown and private land or entirely Crown / private industrial land.
- Requirement of land may range from as small as 3 hectares to as much as 10 hectares depending on log storage requirements and the extent of sorting activity.

4.3 Products

- Custom & internal (own processing) log sorts for:
  - Export markets – average fee for sorting for export is $9.00 – 9.50 / m^3.
  - Domestic market – average fee for sorting for domestic is $6.00 – 7.00 / m^3.

4.4 Investment

- Average investment in site, improvements and equipment, $2.5 million, at 120,000 m^3 / year throughput level.
- Lease – average scale facility ~$75,000 per year.
- Site maintenance –$ 1.20 /m^3 per year. ($28,000 – $30,000 / ha / year).

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4.5 Infrastructure

- Trucking, some log towing & barging where use of inland waterways is required.
- Supplier firms in the form of fuel, materials (wire rope / strapping) and equipment maintenance.
- Waste / debris control – (Transport of hog fuel).

4.6 Market Outlets

- Domestic (BC-based) log buyers and log processors (sawmills, pulp mills etc.).
- Offshore custom log buyers (log export).

4.7 Capacity

- Minimum requirement is approximately 100,000 m^3/year of log throughput depending on log profile.
- Scale of each dry land sort varies considerably – aggregate interior Crown harvest supports as many as forty (40) log sorts ranging widely in scale. (Weight scales operators are not log sorts).

4.8 Labour Markets Employment

- Average dry land log sort supports 13 fulltime jobs – based on 200 shifts per year.
- Payroll averages $720,000 per year.

4.9 Government Revenues

- For longer term use of Crown land – value of a lease is based on the actual land value as determined by the B.C. Assessment Authority.
- Annual rental fees – minimum $500/year – typically 8% of the lease value. vary according to a schedule of prices by log hauling zone.
- The Crown Land, Land Management Manual (Volume 3, Chapter 3.3) describes the forms of land use tenures and pricing applicable to the use of Crown land.
- Property taxes (municipal) – range widely up to as high as $20K / ha / year.
- Contribution to stumpage revenue estimated at $2/$m^3$.

4.10 Regulatory Regime(s)

- The *Forest Act*, Section 73.1– Scale site authorization.
- *Environment and Land Use Act*.

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4.11 Coefficient Area of Crown Land

- Manufacture of log sorts for the purposes of **log export** generates fees (to operator) on average of $\$9/m^3$ – land use coefficient estimate at $240,000 / hectare *
- Manufacture of log sorts for the purposes of **domestic sale** of logs generates fees (to operator) on average of $\$7/m^3$ – land use coefficient estimated at $190,000 / hectare *

*based on log throughput of 120,000 m^3 / sort yard / year

5.0 WATER LOG SORT REGION: PRIMARILY COAST AND ON SOME INTERIOR WATERWAYS

5.1 Geographic Range

- Primarily the coast of British Columbia. Water log sorting is practiced throughout the coastal sub-regions including South Coast (including Vancouver Island), Mid-Coast, North Coast and the Queen Charlotte Islands.

5.2 Resource Requirements

- Foreshore area with a small upland area for support facilities (fuel storage).
- On average water area in the range of 2- 3 hectares is adequate. Area requirement may be considerable where log transportation converges on processing centers, as is the case in Howe Sound, areas of the lower Fraser River and Alberni Inlet.

5.3 Products

- Preliminary sort of camp run harvest for further sorting, or less and less often, a final sort for a timber processing facility.
- Fees for log sorting at a water sort would be in the range of $\$3\text{-}5/m^3$, depending on the number of log sorts and specifications of each log sort.

5.4 Investment

- Equipment – primarily boom boats, perhaps a log loader and barge if some processing of logs is to be conducted concurrent with sorting.
- Capital investment would range significantly $200K up to $1.5 million depending on the mix of log sorting and log processing.
- Annual maintenance in the range of $30 - $50K (tie-ups, anchors and debris control).

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5.5 Infrastructure

- Log towing services – booming and barging.
- Transportation of fuel and supplies.
- Water sorting, storage and transport supports log salvage activity on the coast.
- Estimate the tertiary benefits could be in the range of $\$2/m^3$.

5.6 Market Outlets

- Domestic (BC-based) log buyers and log processors (sawmills, pulp mills etc.)
- Offshore custom log buyers (log export).

5.7 Capacity

- Minimum requirement is approximately 30,000 m^3/year of log throughput depending on log profile.
- Water sorts are numerous through coastal areas – preliminary sorting is usually undertaken at all coastal log dumps.

5.8 Labour Markets Employment

- One and one-half (1.5) full time equivalent jobs based on ~ 200 shifts per year. Boom boat operator and log scaler.
- Payroll in the range of $80K - $100K per year.

5.9 Government Revenues

- Annual rental fees – minimum $500 year (licence of occupation) – vary according to a schedule of prices tiered by log hauling zone.
- The Crown Land, Land Management Manual (Volume 3, Chapter 3.3) describes the forms of land use tenures and pricing applicable to the use of Crown land / foreshore areas for log sorting/storage - Appendix I of this section of the manual lists a fee schedule for log handling, log sorting, and storage, which varies based on the applicable geographic log handling zone.
- Property taxes (municipal) – may be applicable if the water sort if located on foreshore adjacent to municipal land. Taxes vary depending on location.
- Contribution to stumpage revenues – estimate as much as $\$2/m^3$ contribution to stumpage revenue.

5.10 Regulatory Regime(s)

- *Navigable Waters Protection Act*.
- *Fisheries Act* – primarily sections 35 to 43, Fish Habitat Protection and Pollution Prevention.
- The *Forest Act*, Section 73.1 – Scale site authorization.

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5.11 Coefficient Area of Crown Land

- Manufacture of log sorts for the purposes of domestic and export log sales generates fees (to operator) on average of $\$4/m^3$. Economic output coefficient for use of water and foreshore area is estimated at $96,000 / hectare / year *.

  * based on 120,000 m^3 / water sort / year

6.0 GOVERNMENT REVENUES

6.1 Rental Fees

Land & Water British Columbia Incorporated (previously British Columbia Assets and Land Corporation) advises the use of Crown lands, both foreshore and upland parcels, is facilitated through one or a combination of agreements, either a temporary permit, licence of occupation or lease, applicable to Crown land uses including helilog drop zones, dry land and water log sorts and log storage on both foreshore and upland parcels of Crown land:

	General Description	Fees
1. Permits		
	➤ Issued for use of Crown land for less than one year.	$250 per permit.
2. Licence of Occupation		
Best suited to short to medium term use (renewed annually) and water log sorts.	➤ Range in size from 0.2 hectares up to 20 hectares. One licence may include several related sites – this is typically the case for helilog drop zones. Normal term is 10 years.	Minimum fee is $500/year – annual fees are calculated at a rate of 7.5% of the licence value.
3. Lease		
Best suited to the longer-term use of Crown land for the purpose of sorting on dry land.	➤ Normal term is 30 years. ➤ Site must be surveyed and designated for exclusive use by lessee. Term of lease may be as long as ten years.	Rental for a lease is calculated at 8% of the lease value. Minimum annual rental is $500.

An excerpt from the Crown Land, Land Management Manual, Volume 3, Chapter 3.3 is attached, this section of the manual describes the forms of land use tenures and pricing applicable to the use of Crown land for log sorting and log storage. Appendix I of this section of the Land Management Manual describes a fee schedule for log handling including log sorting and storage.

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7.0 INPUT / OUTPUT ESTIMATES FOR LOG SORTS

The Ministry of Forests' has prepared and maintains two manuals, the *Coast Appraisal Manual* and the *Interior Appraisal Manual*, both of which are approved by the Minister of Forests, which together contain the policies and procedures for determining stumpage rates charged for Crown timber harvested in British Columbia.

Both the Coast Appraisal Manual and the Interior Appraisal Manual identify phase cost estimates which under the Comparative Value Pricing System are estimate harvesting and transportation costs which are applied to each cutting authority area for the purposes of calculating the applicable stumpage rate. The phase cost estimates, predictive formulas and several of the data / cost tables in each manual are derived from data collected through surveys of logging and forest management costs incurred by licensees and contractors.

7.1 Dry land and Water Log Sorts – Input / Output Estimate

The economic outcomes associated with dry land log sorting was examined by the provincial government through the Ministry of Forests' direct involvement in a log yard located in the Vernon Forest District. Over the period 1996 – 99, this log yard was directly involved in selling processed or sorted logs, predominantly sourced through the Small Business Forest Enterprise Program, therefore the yard purchased logs and held log inventories in the normal course of business operations. A report[1], prepared by the Ministry of Forests and PriceWaterhouseCoopers, summarizes the costs and revenues associated with the operation of the Vernon Log Yard.

The relevant findings associated with the operation of the Vernon Log Yard are as follows:

- The economic outcomes (profitability) of an independent dry land sort are *"more closely related to the quality of its logs than to the number of sorts, approximately 95% of total revenue in an interior-based log sort may be attributable to only 40% of total number or log sorts produced."*
- *"The profitability of a log yard is driven by the quality of the log profile and current market price of logs."*
- *"...a log yard, selling a timber profile which is average or below average quality, will find it difficult to remain in operation in other than strong lumber markets."*
- *"...there must be a large number of buyers present in order to foster active and competitive bidding for logs."*
- Fixed costs associated with operating a dry land sort are comparatively modest ranging from 4-6% of total costs – however, total costs includes purchasing logs and payment of stumpage.

[1] Vernon Log Yard Review. An Internal Ministry of Forests Review of the Vernon Log Yard Operations 1996/97-1998/99. Forest Enterprises Branch, Ministry of Forests. December 1999.

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The Vernon Log Yard was involved in the purchase and resale of logs and held log inventories over the course of its operation – to the extent possible, this review eliminates log purchases and inventory costs [2] so as to identify only the economic value associated with the activity of log sorting.

The Vernon Log Yard contracted its log sorting requirements for $6.90/m³ over 1996/97 and $6.99/m³ over 1997/98, these rates are consistent with the custom sorting fee of $6-7/ m³ for domestic log sorts which independent log sort yards currently charge.

The *Coast Appraisal Manual* is less useful for isolating a (cost) estimate for sorting only – the manual provides two rates which are aggregate estimates for the combined activities of dump, sort, boom and scale based on the mode of (water borne) log transportation, they are:

- Towing $7.85/m³
- Barging $10.47/m³

Sorting and scaling would represent the largest components of the aggregate estimate – on this basis, the experience of ~7/m³ for log sorting (and scale) is reasonable to the appraisal estimate.

The *Interior Appraisal Manual* identifies an aggregate dump and boom and separate tow, dewater and reload estimates as follows:

Dump & Boom	
➤ Reservoir, lakes & marine	**$3.58/m³**
➤ Natural Lakes	**$2.19/m³**
Tow	**$/m³ = 0.3284+0.007731* d** (d= One-way tow distance)
Dewater & reload	**$2.45/m³**

These rates are not indicative of any water log sorting (virtually all land based in the interior) and any recognition of water borne log storage costs (as may be required on a recurring basis during transport) would be incorporated into the tow estimate.

[2] The intent is to identify the economic contribution of the activity (building block) and not economic gains or losses associated with purchasing logs and holding log inventories over a period of time. Changes in the market value of certain species and log grades can occur over a short period of time.

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7.2 Input / Output Coefficients

An important descriptive characteristic of each building block is the economic outputs generated by each unit of Crown resource utilized as an input to the building block. The area of Crown land or foreshore and water area consumed to support the activity is the (standardized) input unit.

Contributing industry operators were able to estimate the physical area requirement associated with dry-land and water-based log sorting techniques. However, the most efficient measurement for capturing the economic outcomes associated with log sorting operations is $/m^3$. The table below translates the operational measurement, expressed as $/m^3$, into an area-based expression.

Land-Area Coefficient Estimates

Building Block or Economic Activity	Contribution of the BB to end value of products $/m^3$	Coefficient Per hectare of Crown land
Log Sorting		
i. Dry land Sort		
➤ *Export log sorts*	Manufacture of log sorts for the purposes of log export generates fees (to operator) on average of $9/m^3$	**$240,000 / hectare** **
➤ *Domestic log sorts*	Manufacture of log sorts for the purposes of sale of log into local, domestic markets generates fees (to operator) on average of $7/m^3$	**$ 190,000 / hectare** ** **based on 120,000 m^3 / sort yard / year
ii. Water Sort		
➤ *Domestic and Export markets*	Manufacture of log sorts for the purposes of log export generates fees (to operator) on average of $4/m^3$	**$96,000 / hectare / year** (based on 120,000 m^3 / water sort / year)

7.3 Regulatory Requirements

The establishment and operation of either a water-based or dry-land log sort is governed by the *Forest Act*, Section 73.1– scale site authorization.

Water-based log sorting, under the three forms of provincial land use tenures available for log handling (temporary permit, licence of occupation and lease), are regulated by two federal statutes:

1. *Navigable Waters Protection Act*

The main purpose behind the *Navigable Waters Protection Act* is to ensure public access to and efficient use of public waterways in Canada. Water borne log handling, including heli-log drop, log sorting, log storage and transportation (bagging, booming and barging) must be conducted in a fashion which does not result in the creation of navigable water hazards.

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2. *Fisheries Act*

Primarily sections 35 to 43 of the *Fisheries Act*, Fish Habitat Protection and Pollution Prevention, are those sections of the *Act* which impact on log handlers. Water borne log handling must be conducted in a manner so as not to degrade either water quality of fish habitat. This section of the *Fisheries Act* would be applicable to all water borne log-handling activities including heli-log drop.

Companies and Agencies Who Contributed Data to this Study:

- Coulson Forest Products, Port Alberni.
- Terminal Forest Products, Richmond, British Columbia.
- Ridley Island Log Sort, Prince Rupert.
- Central Interior Log Sort, Prince George.
- Ministry of Forests, Victoria.
- Land & Water British Columbia Incorporated, Nanaimo.

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ATTACHMENT 1

Crown Land, Land Use Management Manual
Volume 3, Chapter 3.3

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ATTACHMENT 2

Excerpts of Applicable Regulations

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ATTACHMENT 3

Example of a Log Sorting Offence under the *Fisheries Act*

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